

# Enterprise Information Technology Architecture

The purpose of standards and policy development is the creation of a common statewide information technology architecture. In order to implement technology as efficiently and effectively as possible, it is necessary to view state government as a single enterprise made up of entities which share the common goal for public service and the management of public resources rather than individual, autonomous organizations. The information technology architecture provides the building blocks needed to realize the four components of the vision for information technology in North Dakota:

- **State government should be customer focused.**
- **State government should be efficient.**
- **State government should be well managed.**
- **State government should provide the leadership for developing a shared infrastructure.**

Information Technology Architecture								
Operating Systems & Platforms	Network Services	Application Development	Data Management	Security	Office Automation	Document Imaging	Video Conferencing	Geographic Information Systems
Systems and Project Management								

The basis for information technology standards and policy is the development of a technical infrastructure that will:

- emphasize integration, interoperability, modularity and scalability,
- provide a guide to information technology decision makers,
- lower costs of information technology through reduced support costs and economies of scale,
- provide flexibility to meet the diverse needs of state agencies,
- balance freedom of choice with consistency.

During the past year, ISD, with input from state agencies, has developed standards and policies for a number of components of the state technical

infrastructure. The state standards and policies are available on the Information Services Division web site at <http://www.state.nd.us/isd/planning/>. These standards and policies will drive future technology purchases and implementation. Technology advancements together with industry trends will affect the technology choices available. Because of this, the standards and policies will continue to evolve over time.

## Information Technology Standards and Policies

The following information technology strategies have been developed as a guide for agencies as they plan for and implement technologies. These strategies set the direction for each component of the technology infrastructure and provide a foundation for the specific standards and policies.

### Operating Systems and Platforms

Operating systems and platforms will support a highly networked, workstation based, distributed databases architecture. Existing platforms in this architecture include the Information Services Division's enterprise server, which currently runs network applications and databases as well as legacy systems. The state standards will reflect the industry trend toward open systems and advance the implementation of a consistent end-user interface to a variety of distributed computing services. Operating systems and platforms will support a wide range of commercially available software and development tools and the system platforms will allow for application migration to other platforms as they grow. Support costs will be reduced through standardization within agencies and across the enterprise. Purchasing policies will support the efficient and timely purchase of products that meet the standards.

### Network Services

Communication between agencies and with external customers requires a single, secure, integrated wide area network that is reliable, widely available and allows for flexible growth. The network architecture will be based on common, open, non-proprietary protocols and on industry and product based standards. Network capacity will provide sufficient bandwidth for future expansion and multiple data formats, including voice and video. Commercial services will be used when appropriate and economically justified. Remote access will be available to state agencies with mobile

# Enterprise Information Technology Architecture

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employees or distant offices. Political subdivisions will be provided the opportunity to connect with state agencies and resources.

## Application Development

All application development must support the mission and business objectives of the agency. To maximize the productivity of system developers, application development will use common processes, languages and tools. When designing an application, the following requirements should be considered:

- Performance
- User requirements for ease of use
- Ongoing operations and support costs
- Internet accessibility

The use of reusable objects will be considered to reduce development costs. When possible, development technologies will be used that allow applications to migrate between platforms as they grow. Databases should be independent of the application to allow for system development flexibility. Before development or purchase of a new application, the availability of appropriate maintenance and support must be evaluated. Along with rapid changes in technology, application development advancements will be evaluated and migration processes to the new technology developed as needed. The number of web enabled applications will grow as the Internet becomes the common vehicle for access to public information.

## Data Management

Data is the raw material from which information is produced and the quality, reliability and integrity of the data must be maintained for the information to be useful. As a capital resource, information will be shared wherever possible, however, definitions of the data must be understood so that it is used consistently across the organization. Public data warehouses will be considered as a vehicle to provide access to information in an easy to use fashion. Databases should allow for the storage of multiple object types thereby enhancing the value of the data. The state will move to the use of relational database management systems because of advantages in terms of access, flexibility and ease of use. The investment in application development should be protected from changes in vendor direction by choosing when possible, database management systems that are independent of the platform and application development tools.

The standard will include several commercial database management systems designed to target specific markets. A database management system should be chosen for the application based on the following requirements:

- Size of workgroup
- Accessibility
- Security
- Ease of use
- Anticipated growth
- Business needs
- Performance
- Support and maintenance requirements
- Cost
- Size of database
- Portability
- Product stability

## Security

Security policies and standards cover the physical and electronic access to information as well as the transmission, storage, and processing of information. Security measures will be taken to prevent unauthorized modification or the destruction of critical information or systems. Implementation of security measures must also protect the confidentiality of the sensitive data from unauthorized access. Risks associated with unauthorized access should be analyzed and balanced against the cost of protecting the information to ensure that business activities are not unduly hindered or unnecessary costs incurred. The owning agency shall identify the security requirements of their information based on legal requirements and agency policy and will authorize access to the data on a need-to-know basis. Maintaining the security of the data is a joint responsibility between Information Services Division, state agencies, and their customers who access the data.

## Office Automation

Office automation software will enhance the efficiency and productivity of state personnel. Office automation product standards will be used to maximize information sharing and will be supported by purchasing options such as state contracts and site licensing. Each agency will be responsible

# Enterprise Information Technology Architecture

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for the management of its software licenses. The use of office suite software provides for the integration of software applications and allows for the easy transfer of data from one application to another. E-mail communication is a very important function within and outside state government and requires high reliability and availability. E-mail systems need the capability to include attachments as a way of sharing information. The direction of the state e-mail system is towards an enterprise mail system with all mail routed to a single domain for state agencies, excluding higher education, and an easily accessible state e-mail directory. The Internet, via agency web sites, has become the vehicle for public access to information, replacing or augmenting paper publications. This will drive the need for office automation products that support HTML as a language for formatting information.

## Document Imaging

A document imaging system can potentially reduce paper document storage costs, improve document sharing, provide faster access to documents, and route documents electronically. Such systems can also eliminate the delays inherent to the handling of paper, thereby improving customer service though faster access to information. All paper documents requiring access by multiple users or applications are candidates for document imaging. As with all new technology, a cost benefit analysis should be prepared prior to the purchase of such a system.

## Video Conferencing

Video conferencing is encouraged as an effective means of increasing productivity, extending services and reducing travel time and expense. Standards and policy will provide for the flexible expansion and maximum connectivity of state video conferencing facilities with each other and with external users. The benefits of video conferencing may be further expanded by the use of emerging technologies such as desktop video and IP multicasting. A multi-point bridging service will be centrally managed to provide efficient use of bandwidth and other resources required to interconnect video conferencing systems.

## Project Management

Projects are by definition a temporary process designed to achieve a clearly defined goal or objective within given resource constraints such as time and budget. The standards and policies will ensure that a disciplined, managed, and consistent approach will be used to manage projects, resulting in the

delivery of quality products, on time and within budget. Project management, by its very nature, is an iterative process involving planning, monitoring, evaluating and taking corrective action throughout the project. Because information technology projects vary in size and scope, project management guidelines must be flexible enough to accommodate a wide variety of projects from small, well-defined efforts with readily achievable goals to large, complex or risky ventures.